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EXAMINER	
CHOJNACKI, MELLISSA M	
ART UNIT	**PAPER NUMBER**
2164	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/021,520	ZUZARTE, CALISTO PAUL	
	Examiner	Art Unit	
	Mellissa M. Chojnacki	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

SAM RIMELL
PRIMARY EXAMINER

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. In response to communications filed on July 1, 2005, claims 1, 16, 21 and 23 have been amended, new claim 24 has been added, therefore claims 1-23 are presently pending in the application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-8, and 16-23, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 16, 21 and 23, recite the limitation "extra information", which renders the claim vague and indefinite, because it is unclear as to what "extra information" is or signifies in the claims.

Claims 2-8, 16-20 and 22 are rejected because they are dependent on rejected independent claims 1, 16, 21 and 23.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ziauddin (U.S. Patent No. 6,029,163), in view of Schiefer et al. (U.S. Patent No. 5,761,653).

As to Claim 1, Ziauddin teaches a method, for use in query optimization in a relational database management system (See Abstract), the method comprising the steps of:

(a) generating statistical information regarding data which represents the results of an operation involving one or more columns of a database (See column 3, lines 5-22).

Ziauddin does not teach (b) deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and (c) using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

Schiefer et al. teaches a method for estimating cardinalities for query processing in a relational database management system (See Abstract), in which he teaches deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data (See column 8, lines 3-32, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13); and

using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan (See column 2, lines 37-41; column 5, lines 63-67; column 6, lines 18-36; column 8, lines 3-27, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Ziauddin, to include deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Ziauddin, by the teachings of Schiefer et al. because deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan would help the relational database management system to use the query optimizer to analyze how to best conduct the user's query of the database with optimum speed in accessing the database (See Schiefer et al., column 1, lines 48-51).

As to claim 2, Ziauddin as modified, teaches creating a materialized column containing the data, wherein the data comprises the results of the operation involving one or more columns of a database (See Ziauddin, column 1, lines 20-24; column 3, lines 5-11).

As to claim 3, Ziauddin as modified, teaches wherein the materialized column is stored in the database (See Ziauddin, column 1, lines 20-24).

As to claim 4 and 17, Ziauddin as modified, teaches wherein the statistical soft constraint comprises a constraint predicate and an associated probability value, the associated probability value reflecting the percentage of rows of the one or more columns for which the constraint predicate is true (See Schiefer et al., column 7, lines 32-63; column 8, lines 1-28, where the statistical equations "|C2|=1000" and "|C1|* |C2|* ff_3=100*1950*1%+1950" are read on "statistical soft constraint"; and see column 10, lines 26-43); wherein the statistical soft constraint comprises a constraint predicate and an associated probability value reflecting the percentage of rows of the one or more columns for which the constraint predicate is true (See Schiefer et al., column 7, lines 32-63; column 8, lines 1-28, where the statistical equations "|C2|=1000" and "|C1|*|C2|* ff_3=100*1950*1%+1950" are read on "statistical soft constraint"; and see column 10, lines 26-43).

As to claim 5, Ziauddin as modified, teaches wherein the step of generating statistical information comprises gathering the statistical information regarding the data utilizing a statistics gathering process provided by the relational database management system (See Ziauddin, column 2, lines 42-45; column 3, lines 11-14).

As to claim 6, Ziauddin as modified, teaches wherein the step of generating statistical information comprises analyzing the data using an SQL statement (See Schiefer et al., column 1, lines 25-29, where "commands in SQL" is read on "SQL statements").

As to claim 7, Ziauddin as modified, teaches wherein the SQL statement groups a selection to obtain frequencies (See Schiefer et al., column 2, lines 19-33, where "duplicate" is read on "frequencies").

As to claim 8, Ziauddin as modified, teaches further comprising the step, prior to step (b), of analyzing the statistical information and determining a useful subset of the statistical information from which to derive the statistical soft constraint (See Schiefer et al., column 12, lines 34-43).

As to Claim 9, Ziauddin teaches a method for use in query optimization in a relational database management system (See Abstract), the method comprising the steps of:

(a) generating statistical information regarding data which represents the results of an operation involving one or more columns of a database (See column 3, lines 5-22).

Ziauddin does not teach (b) deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data wherein the statistical soft constraint comprises a constraint predicate and an associated probability value, the associated probability value reflecting the percentage of rows of the one or more columns for which the constraint predicate is true; and (c) using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

Schiefer et al. teaches a method for estimating cardinalities for query processing in a relational database management system (See Abstract), in which he teaches (b) deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data wherein the statistical soft constraint comprises a constraint predicate and an associated probability value, the associated probability value reflecting the percentage of rows of the one or more columns for which the constraint predicate is true (See column 7, lines 32-63; column 8, lines 1-28, where the statistical equations "|C2|=1000" and "|C1|* |C2|* ff_3=100*1950*1%+1950" are read on "statistical soft constraint"; and see column 10, lines 26-43); and (c) using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan (See column 2, lines 37-41; column 5, lines 63-67; column 6, lines 18-36; column 8, lines 3-27, where the statistical equation "|C1|* |C2|*

ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Ziauddin, to include (b) deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data wherein the statistical soft constraint comprises a constraint predicate and an associated probability value, the associated probability value reflecting the percentage of rows of the one or more columns for which the constraint predicate is true; and (c) using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Ziauddin, by the teachings of Schiefer et al. because (b) deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data wherein the statistical soft constraint comprises a constraint predicate and an associated probability value, the associated probability value reflecting the percentage of rows of the one or more columns for which the constraint predicate is true; and (c) using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan would help the relational database management system to use the query optimizer to analyze how to best conduct the user's query of the database with optimum speed in accessing the database (See Schiefer et al., column 1, lines 48-51).

As to claim 10, Ziauddin as modified, teaches wherein the query predicate comprises an expression involving two different columns (See Schiefer at al., column 3, lines 34-37; column 6, lines 18-21).

As to claims 11 and 13 Ziauddin as modified, teaches wherein the step (c) of using the statistical soft constraint (See column 8, lines 3-32, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13) comprises the steps of: (cl) normalizing the query predicate, if necessary, such that the right-hand side of the query predicate expression comprises a constant (See Schiefer et al., column 7, lines 60-63; column 9, lines 53-56); (c2) determining whether the query predicate matches the constraint predicate (See Schiefer et al., column 9, lines 52-65, where "functionally determine" is read on "match"); (c3) setting a selectivity for the query predicate equal to the associated probability value if the query predicate matches the constraint predicate (See Schiefer et al., column 9, lines 52-65); and (c4) setting a selectivity boundary for the query predicate based upon the associated probability value if the query predicate does not match the constraint predicate (See Schiefer et al., column 9, lines 52-65; column 11, lines 14-42); wherein the step (c) of using the statistical soft constraint (See Schiefer et al., column 8, lines 3-32, where the statistical equation "|C1|*|C2|*ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13) comprises the steps of: (cl)

normalizing the query predicate, if necessary, such that the right-hand side of the query predicate expression comprises a constant (See Schiefer et al., column 7, lines 60-63; column 9, lines 53-56); (c2) determining whether the query predicate matches the constraint predicate (See Ziauddin, column 8, lines 19-29);also see Schiefer et al., column 9, lines 52-65, where "functionally determine" is read on "match"); (c3) setting a selectivity for the query predicate equal to the associated probability value if the query predicate matches the constraint predicate (See Schiefer et al., column 9, lines 52-65); and (c4) setting a selectivity boundary for the query predicate based upon the associated probability value if the query predicate does not match the constraint predicate (See Schiefer et al., column 9, lines 52-65; column 11, lines 14-42).

As to claim 12, Ziauddin as modified, teaches wherein the query predicate comprises an operation upon a column (See Schiefer at al., column 3, lines 34-37; column 6, lines 18-21).

As to claim 14, Ziauddin as modified, teaches wherein the query predicate comprises two predicates (See Ziauddin, column 6, lines 33-36. It is inherent that "predicates" means more than one predicate. Also see Schiefer at al., column 6, lines 18-21; column 10, lines 42-13), the first predicate involving a first column and the second predicate involving a second column (See Schiefer at al., column 10, lines 42-13), the first column being a different column from the second

column, wherein the constraint predicate comprises and expression including the first column and the second column (See Schiefer at al., column 10, lines 31-47).

As to claim 15, Ziauddin as modified, teaches wherein the step (cl) of using the statistical soft constraint (See Schiefer et al., column 8, lines 3-32, where the statistical equation "|C1|*|C2|*ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13) comprises the steps of:

(c1) normalizing the constraint predicate, if necessary, to produce a normalized constraint predicate wherein the left-hand side of the normalized constraint predicate comprises the first column (See Schiefer et al., column 7, lines 60-63; column 9, lines 53-56);

(c2) substituting occurrences of the first column in the first predicate with the right-hand side of the normalized constraint predicate, such that the first predicate only refers to the second column (See Schiefer et al., column 7, lines 60-63; column 9, lines 53-56);

(c3) transposing the first predicate, if necessary, to produce a transposed first predicate wherein the left-hand side of the transposed first predicate comprises the second column (See Schiefer et al., column 7, lines 60-63; column 9, lines 53-56); and

(c4) setting a selectivity or selectivity bound based upon the transposed first predicate, the second predicate and statistical information regarding the

second column (See Schiefer et al., column 9, lines 52-65; column 11, lines 14-42).

As to Claim 16, Ziauddin teaches a database management system (See Abstract) comprising:

means for generating statistical information regarding data which represents the results of an operation involving one or more columns of a database (See column 3, lines 5-11; lines 11-27).

Ziauddin does not teach means for generating a statistical soft constraint using the statistical information, wherein the statistical soft constraint is not necessarily valid for all of the data; and means for utilizing the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

Schiefer et al. teaches a method for estimating cardinalities for query processing in a relational database management system (See Abstract), in which he teaches means for generating a statistical soft constraint using the statistical information, wherein the statistical soft constraint is not necessarily valid for all of the data (See column 8, lines 3-32, where the statistical equation "|C1|*|C2|*ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13); and

means for utilizing the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan (See column 2, lines 37-41; column 5, lines 63-67; column 6, lines 18-36; column 8,

lines 3-27, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Ziauddin, to means for generating a statistical soft constraint using the statistical information, wherein the statistical soft constraint is not necessarily valid for all of the data; and means for utilizing the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Ziauddin, by the teachings of Schiefer et al. because means for generating a statistical soft constraint using the statistical information, wherein the statistical soft constraint is not necessarily valid for all of the data; and means for utilizing the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan would help the relational database management system to use the query optimizer to analyze how to best conduct the user's query of the database with optimum speed in accessing the database (See Schiefer et al., column 1, lines 48-51).

As to claim 18, Ziauddin as modified, teaches wherein the means for utilizing (See Schiefer et al., column 3, lines 38-41) comprises:

means for identifying a type of the query predicate (See Ziauddin, Abstract; column 3, lines 42-50);

means for normalizing the query predicate and the constraint predicate (See Schiefer et al., column 7, lines 60-63; column 9, lines 53-56);

means for comparing the query predicate with the constraint predicate (See Schiefer et al., column 9, lines 52-65);

means for setting a selectivity equal to the probability value when the query predicate matches the constraint predicate (See Schiefer et al., column 9, lines 52-65; column 11, lines 14-42); and

means for setting a selectivity bound based upon the probability value when the query predicate does not match the constraint predicate (See Schiefer et al., column 9, lines 52-65; column 11, lines 14-42).

As to Claim 19, Ziauddin as modified, teaches wherein the query predicate comprises a first and second predicate (See Schiefer et al., column 10, lines 42-43, where "predicate for column C1" can be read on "first" and "predicate for column C2" can be read on "second predicate").

As to Claim 20, Ziauddin as modified, wherein the means for utilizing further comprises:

means for generating a twin predicate from the first predicate (See Ziauddin, column 8, lines 19-29, where "duplicate" is read on "twin"); and

means for setting a selectivity or selectivity bound based upon the twin predicate, the second predicate and the probability value (See Ziauddin, column

8, lines 19-29, where "duplicate" is read on "twin"; also see Schiefer et al., column 9, lines 52-65; column 11, lines 14-42).

As to Claim 21, Ziauddin teaches (i) generating statistical information regarding data which represents the results of an operation involving one or more columns of a database (See column 3, lines 5-11; lines 11-27);

Ziauddin does not teach a computer program product comprising:

(a) a computer readable medium; (b) code means contained in the medium for instructing a computer to perform the steps of: (ii) deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and (iii) using the statistical soft constraint to estimate a cardinality value for the result of a query predicate in a query plan.

Schiefer et al. teaches a method for estimating cardinalities for query processing in a relational database management system (See Abstract), in which he teaches a computer program product (See column 19, lines 25-29) comprising:

a computer readable medium (See column 19, lines 25-29. It is inherent that a "computer program" is "a computer readable medium");

code means contained in the medium for instructing a computer to perform the steps of (See column 19, lines 25-29. It is inherent that a "computer program" is "a computer readable medium" and "a computer program" comprises of "code"):

deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data (See column 8, lines 3-32, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13); and

using the statistical soft constraint to estimate a cardinality value for the result of a query predicate in a query plan (See column 2, lines 37-41; column 5, lines 63-67; column 6, lines 18-36; column 8, lines 3-27, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Ziauddin, to include a computer program product comprising: a computer readable medium; code means contained in the medium for instructing a computer to perform the steps of: deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and using the statistical soft constraint to estimate a cardinality value for the result of a query predicate in a query plan.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Ziauddin, by the teachings of Schiefer et al. because a computer program product comprising: a computer readable medium; code means contained in the medium for instructing a computer to perform the steps of: deriving a statistical soft constraint from the

statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and using the statistical soft constraint to estimate a cardinality value for the result of a query predicate in a query plan would help the relational database management system to use the query optimizer to analyze how to best conduct the user's query of the database with optimum speed in accessing the database (See Schiefer et al., column 1, lines 48-51).

As to Claim 22, Ziauddin as modified, teaches wherein the computer readable medium is chosen from the group consisting of a modulated electrical signal, a modulated optical signal, a magnetic storage medium and an optical storage medium (See Ziauddin, column 5, lines 13-42).

As to Claim 23, Ziauddin teaches (a) generating statistical information regarding data which represents the results of an operation involving one or more columns of a database (See column 3, lines 5-11; lines 11-27);

Ziauddin does not teach a computer readable medium containing program instructions for use in query optimization in a relational database management system, the program instructions for: (b) deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and (c) using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

Schiefer et al. teaches a method for estimating cardinalities for query processing in a relational database management system (See Abstract), in which he teaches a computer readable medium containing program instructions for use in query optimization in a relational database management system (See Abstract; column 19, lines 25-32. It is inherent that a "computer program" is "a computer readable medium"), the program instructions for:

deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data (See column 8, lines 3-32, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13); and

using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan (See column 2, lines 37-41; column 5, lines 63-67; column 6, lines 18-36; column 8, lines 3-27, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Ziauddin, to include a computer readable medium containing program instructions for use in query optimization in a relational database management system, the program instructions for: deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and using the statistical soft constraint

to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Ziauddin, by the teachings of Schiefer et al. because a computer readable medium containing program instructions for use in query optimization in a relational database management system, the program instructions for: deriving a statistical soft constraint from the statistical information that reflects a statistical property of the data, wherein the statistical soft constraint is not necessarily valid for all of the data; and using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan would help the relational database management system to use the query optimizer to analyze how to best conduct the user's query of the database with optimum speed in accessing the database (See Schiefer et al., column 1, lines 48-51).

As to Claim 24, Ziauddin teaches a method, for use in query optimization in a relational database management system (See abstract), the method comprising the steps of:

(a) generating statistical information regarding data which represents the results of an operation involving one or more columns of a database (See column 3, lines 5-11; lines 11-27).

Ziauddin does not teach deriving a statistical soft constraint from the statistical information, wherein the statistical soft constraint comprises the

statistical information as an extra piece of information along with an expression expected in an ordinary integrity constraint; and using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan.

Schiefer et al. teaches a method for estimating cardinalities for query processing in a relational database management system (See Abstract), in which he teaches deriving a statistical soft constraint from the statistical information, wherein the statistical soft constraint comprises the statistical information as an extra piece of information along with an expression expected in an ordinary integrity constraint (See column 8, lines 3-32, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13); and using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan (See column 2, lines 37-41; column 5, lines 63-67; column 6, lines 18-36; column 8, lines 3-27, where the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" is read on "statistical soft constraint"; also see column 10, lines 26-13).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Ziauddin, to include deriving a statistical soft constraint from the statistical information, wherein the statistical soft constraint comprises the statistical information as an extra piece of information along with an expression expected in an ordinary integrity constraint; and using the statistical soft constraint to estimate a

cardinality value for the result of applying one or more query predicates in a query plan.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Ziauddin, by the teachings of Schiefer et al. because deriving a statistical soft constraint from the statistical information, wherein the statistical soft constraint comprises the statistical information as an extra piece of information along with an expression expected in an ordinary integrity constraint; and using the statistical soft constraint to estimate a cardinality value for the result of applying one or more query predicates in a query plan would help the relational database management system to use the query optimizer to analyze how to best conduct the user's query of the database with optimum speed in accessing the database (See Schiefer et al., column 1, lines 48-51).

Response to Arguments

6. Applicant's arguments filed on 01-July -2005, with respect to the rejected claims 1-24 have been fully considered but they are not found to be persuasive:

In response to applicants' arguments regarding "Schiefer does not teach that a unique key is a 'statistical soft constraint'", the arguments have been fully considered but are not deemed persuasive, because Schiefer et al. teaches "unique keys" to estimate cardinalities. The statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" in Schiefer et al. is read on "statistical soft constraint"

in order to estimate cardinality (See column 8, lines 3-32; column 10, lines 23-57).

In response to applicants' arguments regarding "Schiefer does not teach or suggest using the 'statistical soft constraint' to estimate cardinality value for the result of applying one or more query predicates in a query plan", the arguments have been fully considered but are not deemed persuasive, because Schiefer et al. teaches estimating key cardinality by one or more local predicates in order to select an efficient query plan (See column 2, lines 33-54; column 5, lines 63-67). Schiefer et al also teaches the statistical equation "|C1|* |C2|* ff_3=100*1950*1%+1950" which is read on "statistical soft constraint" in order to estimate cardinality (See column 8, lines 3-32; column 10, lines 23-57).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mellissa M. Chojnacki whose telephone number is (571) 272-4076. The examiner can normally be reached on 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

September 28, 2005
Mmc

SAM RIMELL
PRIMARY EXAMINER